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Indian Standard

METHOD OF TEST FOR QUALITY CHARACTERISTICS OF PULSES

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Indian Standard

METHOD OF TEST FOR QUALITY CHARACTERISTICS OF PULSES

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Indian Standard

METHOD OF TEST FOR QUALITY CHARACTERISTICS OF PULSES

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 31 January 1984, after the draft finalized by the Foodgrains and Foodgrain Industries Sectional Committee had been approved by the Agricultural and Food Products Division Council.

0.2 With the increasing inter-state transactions and centralization of corporations and co-operative societies for handling foodgrains, the assessment of foodgrain quality has assumed a greater significance. For proper assessment, it is necessary that only uniform methods of test are adopted and only those terms are used in test reports which have been defined properly. This standard. based on national and international practices is, therefore being issued to ensure the adoption of uniform terminology and methods of test for foodgrains throughout the country. It is also expected that this standard would help farmers in assessing and thus better processing of their produce. Besides, it would help in fixation of price of foodgrains on a scientific basis and in narrowing down misunderstanding between the purchasers and the vendors.

0.3 In the formulation of this standard due consideration has been given to the *Prevention of Food Adulteration Act, 1954*, and Rules framed thereunder. Due consideration has also been given to the *Standards of Weights and Measures (Packaged Commodities) Rules. 1977*. However, this standard is subject to restriction imposed under these rules, wherever applicable.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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*Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard prescribes the methods of test for quality characteristics of pulses which have not been processed.

2. QUALITY OF REAGENT

2.1 Unless specified otherwise, pure chemicals and distilled water (*see* IS : 1070-1977*) shall be used in tests.

NOTE — ' Pure chemicals ' shall mean chemicals that do not contain impurities which affect the test results.

3. DETERMINATION OF IMPURITIES

3.1 Preparation of Test Sample — Thoroughly mix the final lot sample obtained according to IS : 2814-1978† or IS : 3714-1978‡.

3.2 Test Portion — Reduce the test sample (**3.1**), if necessary, by means of an automatic sample divider or by hand, to obtain the test portion. The minimum mass of a test portion for one determination, shall be 200 g, except for butter beans (*Phasedus lunatus* L.), and horse beans (*Vica faba* L.), for which it shall be 300 g. If the content of impurities is very small, it may be necessary to increase the mass of the test portion considerably.

3.3 Determination — Separate the test portion (**3.2**) into component groups in order to obtain information on the use for which the lot is suitable. Generally the test portion is separated into five groups as follows:

a) Seeds typical of the species and variety (*see* **3.3.1**),
b) Seeds typical of the species but of another variety (*see* **3.3.2**),
c) Defective seeds belonging to the same species (*see* **3.3.3**),
d) Organic impurities (*see* **3.3.4**), and
e) Inorganic impurities (*see* **3.3.5**).

3.3.1 *Seeds Typical of the Species and Variety* — This group includes all intact sound typical seeds, those with a cracked or injured seed-coat, those slightly infested by insects, and broken typical seeds larger than one-half their original size.

This group may be subdivided if desired.

3.3.2 *Seeds Typical of the Species But of Another Variety* — This group includes seeds of varieties which differ significantly in shape, size, colour or appearance.

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*Specification for water for general laboratory use (*second revision*).

†Method for sampling of smaller size foodgrains (*first revision*).

‡Method for sampling of bigger size foodgrains (*first revision*).

3.3.3 *Defective Seeds Belonging to the Same Species* — This group includes broken, bitten and injured seeds equal to or less than one-half their original size, seeds visibly damaged by insects, shrivelled, unripe, and germinated seeds, and rotten, mouldy and diseased seeds.

3.3.4 *Organic Impurities* — This group includes seed-coats, parts of stems, pods, leaves, etc, other crop seeds and weed seeds.

3.3.5 *Inorganic Impurities* — This group includes earth, sand, dust, stones, etc.

4. DETERMINATION OF SIZE (OF PULSES INTENDED FOR HUMAN CONSUMPTION)

4.1 Carry out the determination of size on material falling within the groups described in **3.3.1** and **3.3.2.**

According to the species of pulse, use sieves either with round holes (for example, for peas and lentils) or with suitable elongated holes (for example, for beans).

5. DETERMINATION OF THE MASS OF 1 000 GRAINS

5.1 Carry out the determination as specified in IS : 4333 (Part 4)-1968*.

6. TESTS FOR PRESENCE OF FOREIGN ODOURS

6.1 This examination shall be carried out as soon as possible after sampling, either on the sample in its original condition or on the ground sample.

6.2 Spread the sample and smell it, if no strong foreign odour is observed, reseal the sample container, leave it for 24 hours and then re-examine the sample. The sample may also be examined during grinding.

6.2.1 If, after these operations, no foreign odour can be detected with certainty, put about 3 to 5 g of the ground sample into a flask of 50 to 100 ml capacity. Examine the ground sample heated to a temperature not higher than 60°C by cautiously moving the open flask over a flame or repeatedly shaking it in a water-bath.

6.3 A rapid method (enhancing the development of the odour) is as follows:

> Put a small quantity of the product in a beaker, pour some warm water (60 to 70°C), cover, decant the water after 2 to 3 minutes and note whether foreign odours are present.

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*Methods of analysis for foodgrains: Part 4 Weight of 1 000 grains.

7. TESTS FOR INFESTATION BY INSECTS

7.1 Carry out the tests as per IS : 6261-1971*.

8. TESTS OF SPECIES AND VARIETY

8.0 By examination of the seeds, species and variety can be determined using morphological, physical and chemical methods.

8.1 Determination of Rogues in Lots of Harvest Peas — Use the morphological method (**8.1.1**) or, if the two kinds of peas cannot be distinguished in this way, use the chemical method (**8.1.2**) or the quartz-lamp method (**8.1.3**). Carry out four tests in parallel, take the mean and express the result as a percentage.

8.1.1 *Morphological Method* — The value of harvest peas for human consumption, when containing light-coloured seeds, is lowered by the presence of rogues. Generally, it is not difficult to distinguish them from each other. The colour of harvest peas is light yellow or green, and their hilum has, in almost all cases, a light shade. The seed-coat of the rouge is uniformly grey, or shows violet spots or a marbled brown. The hilum is brown or black.

8.1.2 *Chemical Method* — Soak the selected seeds in water at room temperature for 3 hours. The test can be accelerated by boiling the seeds for 20 minutes instead of soaking them. If the swelling of the seeds proceeds slowly, extend the period of soaking or boiling. Score the seed-coats of seeds that do not swell. When the seeds have swollen, decant the water and place them in a glass vessel containing 10 g/l potassium carbonate solution or a 50 g/l sodium hydroxide solution. After 5 to 10 minutes, a dark discoloration (brown or black) can be observed on the rogues or on their hila, whereas the harvest peas do not change their colour.

8.1.3 *Quartz-Lamp Method* — Examine the seeds under ultra-violet light. The seeds of harvest peas show a blue or pink fluorescence, slightly shaded by violet, whereas the rogues show a brownish shade.

8.2 Determination of Lentil Vetch (*Vicia sativa* **Var** *Lentil sperma*) **Occurring in Lentils as an Impurity**

8.2.1 *Morphological Method* — Lentil vetches are characterized by rather thick borders of the seeds, by deep centres on the hila and by larger hila than those of the lentils. Lentil seeds have thinner borders and exhibit darker colours along the border.

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*Methods of analysis for detection of insect and rodent contamination in grains and milled products.

8.2.2 *Quartz-Lamp Method* — Remove the seed-coat from the two flat sides of the seeds and examine them under ultra-violet light. Lentil seeds show a greenish-grey fluorescence, whereas lentil vetch seeds show a pink fluorescence.

8.3 Examination of Sweet and of Bitter Seeds of Lupins

8.3.1 *Chemical Method*

8.3.1.1 *Test solution* — Dissolve 60 g of iodine and 93 g of potassium iodide in 1 litre of water; before use, leave this stock solution to stand for 2 to 3 days. For each test, dilute 75 ml of the stock solution with water to 1 litres and leave it to stand for 24 hours.

8.3.1.2 *Procedure* — Form a test portion by drawing 100 seeds four times. In the case of sweet yellow lupins and bitter lupins, cut the seeds in two and immerse half of them in the test solution (**8.3.1.1**) at a temperature of about 20°C for a few seconds, then rinse with water. The cut surface of the seeds of bitter lupins shows a dark brown colour, while that of the sweet ones shows a light yellow colour. The seeds of sweet while lupins may be immersed in the test solution for 2 to 5 minutes, without previous cutting. The seeds will be coloured dark green. Rinse them in lukewarm water until the sweet lupin seeds become white and the bitter ones rusty brown. Seeds having a hard seed coat will not become green, but will only assume a light rusty brown colour. If the distinction is rather doubtful, these seeds may be also cut in halves and the cut surface coloured.

8.3.2 *Quartz-Lamp Method* — Examine cut surfaces of seeds under ultra-violet light. The cut surface of bitter lupin seeds becomes fluorescent, whereas that of sweet ones remains dark.

8.4 Determination of '*Khesari Dal*'

8.4.1 *Quick Test Method* — Add 50 ml of dilute hydrochloric acid to 'dal' and keep on simmering water for about 15 minutes. The pink colour, if developed, indicates the presence of *Khesari dal.*

(*Continued from page* 2)

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